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## (54) IMAGE PROCESSING DEVICE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To identify yellow color or the like simultaneously with two color separation to red color by a method wherein the specified threshold concerning colors except an assigned color is set all the time.

**SOLUTION:** If red color or blue color is set at a color detecting part 101 as an assigned color, R signal, G signal and B signal, which are respectively obtained by separating color manuscript images, are inputted in the color detecting part 101. For example, when red color is set as the assigned color, on the basis of two correction values KR1 and KR2 to the red color and the threshold KG to the green color, objective pixels are judged whether they satisfy the judging conditions:  $G > KG$ .

$R > G + KR1$ ,  $R > G + KR2$ , in which R and G are respectively the amounts of red and green lights of the pixel subjected to judgement represented by the values of R and G signals, or not. As a result, data indicating colors are formed so as to be supplied to a color deviation correcting part 103 while data not indicating colors are supplied to a black and white judging part 102. Thus, to the same pixel, two color separation to red color can be executed and, at the same time, yellow color or the like can be identified.



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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]**

**[0001]**

**[Field of the Invention]** With respect to the image processing system used with a copying machine with a digital-image-processing function, FAX equipment, printer equipment, etc., this invention processes especially a color copy image, and relates to the image processing system which extracted color information other than 2 color information, such as information on an assignment color, and black information, for example, the information on yellow etc.

**[0002]**

**[Description of the Prior Art]** It carries out to the color separation approach used with red / black, or blue/black 2 color copying machine, i.e., the approach of carrying out color separation of the color copy image. Conventionally, the method of decomposing into red and three green and blue colors, and changing a color copy image into 2 color images of red/black with the red data and green data of them or the approach of changing into 2 color images of blue/red with blue data and black data is proposed. By such color separation approach, with the red data and green data which are inputted beforehand, red, The approach of setting up the judgment range of black and white, processing a color copy image based on these contents of a setting, and generating red / 2 black color images, or the blue data inputted beforehand, With red data, set up the judgment range of blue, black, and white, and a color copy image is processed based on these contents of a setting. A color copy image is changed into 2 color images by the approach of generating 2 blue/black color images etc., and processing to a color gap is performed by the amendment approach corresponding to a 1-pixel color gap etc.

**[0003]**

**[Problem(s) to be Solved by the Invention]** However, there was a problem which is described below by the conventional 2 color-separation approach mentioned above. That is, by the conventional 2 color-separation approach, since processing of the separation over colors other than the color currently used with the development counter with which the image processing system is equipped, or a judgment is omitted and any information other than the assignment color on a manuscript (color of the toner used with a development counter) cannot be taken out independently, in case a color copy image is changed into 2 color images, a color can be divided into an assignment color and black. For this reason, even if it was going to detect colors other than the assignment color on a manuscript, for example, the color of a marker pen, there was a problem that this was undetectable, by the conventional 2 color-separation approach. This invention is made in view of the above-mentioned situation, and in claim 1, when an assignment color is red, it aims unrelated to red discernment at offering the image processing system which can identify yellow etc. at the same time it only always sets up the threshold about colors other than an assignment color, for example, yellow etc., and performs 2 color separation to red to the same pixel of a color copy image. In claim 2, when an assignment color is blue, it aims at offering the image processing system which can identify yellow etc. regardless of blue discernment only by always setting up the threshold about colors other than an assignment color, for example, yellow etc., while performing 2 color separation which receives blue to the same pixel of a color copy image. By the setting range of

the threshold used when identifying the setting range or yellow of a threshold used in claim 3 when an assignment color is red, and identifying red, while the same pixel is identified by red. When identified by yellow, priority can be given to the direction discriminated from the red used as an assignment color, and it aims at offering the image processing system which can make the red image on a manuscript image reproduce certainly by this. While the same pixel is identified by the setting range of the threshold used when identifying the setting range or yellow of a threshold used in claim 4 when an assignment color is blue, and identifying blue. When identified by yellow, priority can be given to the direction used as an assignment color identified as it is blue, and it aims at offering the image processing system which can make the blue image on a manuscript image reproduce certainly by this. In claim 5, when the manuscript image used as a processing object is specified as monochrome image, only the color specified among red, blue, or yellow can be identified, and it aims at offering the image processing system which can detect the color mark filled in by this on the manuscript. In claim 6, when the manuscript image used as a processing object is specified as monochrome image, two colors specified among red, blue, or yellow can be identified, and it aims at offering the image processing system which can detect two kinds of color marks filled in by this on the manuscript.

[0004]

[Means for Solving the Problem] To each pixel which constitutes said color picture in case it changes into 2 color images which this invention decomposes a color picture into three colors of red, green, and blue in claim 1, and make said color picture red and make black an assignment color based on each of these light values in order to attain the above-mentioned purpose, the 1st red correction value, the 2nd red correction value, and the threshold that receives green are used, and it is  $G > KG$ . -- (1)

$R > G + KR1$  -- (2)

$R > G + KR2$  -- (3)

However, the red quantity of light  $G$  of the pixel for  $R$ :judging: The amount  $KG$  of green light of the pixel for a judgment : The threshold  $KR1$ : 1st red correction value  $KR2$  which receives green : It has the function to calculate the 2nd red correction value. In the image processing system equipped with the color detecting element which judges the color of a pixel to the pixel in which the aforementioned (1) formula and (2) types are materialized, or the aforementioned (1) formula is abortive, and the aforementioned (3) formula is materialized to be red, and judges that the color of a pixel is not red to pixels other than this  $R \geq Tr$  -- (7)

$G \geq Tg$  -- (8)

$B \leq Tb$  -- (9)

However, the threshold  $Tg$  of the amount  $Tr$ : red of blue glow of the pixel for an amount [ of green light ]  $B$ : judging of the pixel for a red quantity-of-light  $G$ : judging of the pixel for  $R$ : judging:  $R < G + Tgr$  among the pixels which fulfill each decision conditions which are shown by threshold these (7) green and blue threshold  $Tb$ : - [ formula ] (9) formulas, and which are carried out -- (10)

It is characterized by judging the pixel which fulfills the conditions shown in this (10) type to be yellow.

[0005] In claim 2, a color picture is decomposed into three colors of red, green, and blue, the 1st blue correction value, the 2nd blue correction value, and the threshold that receives green are used to each pixel which constitutes said color picture in case it changes into 2 color images which make said color picture blue and make black an assignment color based on each of these light values, and it is  $R > KR$ . -- (4)

$B > R + KB1$  -- (5)

$B > R + KB2$  -- (6)

However, the red quantity of light  $B$  of the pixel for  $R$ :judging: The amount  $KR$  of blue glow of the pixel for a judgment : The threshold  $KB1$ : 1st blue correction value  $KB2$  over red : It has the function to calculate the 2nd blue correction value. In the image processing system equipped with the color detecting element which judges the color of a pixel to the pixel in which the aforementioned (4) formula and (5) types are materialized, or the aforementioned (4) formula is abortive, and the aforementioned (6) formula is materialized to be blue, and judges that the color of a pixel is not blue to pixels other than this

$$R \geq Tr \text{ -- (7)}$$

$$G \geq Tg \text{ -- (8)}$$

$$B \leq Tb \text{ -- (9)}$$

However, the threshold  $Tg$  of the amount  $Tr$ :red of blue glow of the pixel for an amount [ of green light ]  $B$ :judging of the pixel for a red quantity-of-light  $G$ :judging of the pixel for  $R$ :judging:  $R < G + Tgr$  among the pixels which fulfill each decision conditions shown by threshold these (7) green and blue threshold  $Tb$ :- [ formula ] (9) formulas -- (10)

It is characterized by judging the pixel which fulfills the conditions shown in this (10) type to be yellow.

[0006] In claim 3, in the image processing system according to claim 1, when an assignment color is red, it is characterized by giving priority to the red used as an assignment color, and determining the color of a pixel by it, when the same pixels are judged to be red and yellow by the setting range of the threshold which judges the setting range of the threshold which judges the color of a pixel to be red, or the color of said pixel to be yellow. In claim 4, in the image processing system according to claim 2, when an assignment color is blue, it is characterized by giving priority to the blue used as an assignment color, and determining the color of a pixel by it, when the same pixels are judged to be blue and yellow by the setting range of the threshold which judges the setting range of the threshold which judges the color of a pixel to be blue, or the color of said pixel to be yellow. In claim 5, in the image processing system according to claim 1 or 2, when a monochrome manuscript image is specified as a manuscript image used as a processing object, it is characterized by identifying one color independently among red, blue, or yellow. In claim 6, in the image processing system according to claim 1 or 2, when a monochrome manuscript image is specified as a manuscript image used as a processing object, it is characterized by identifying two colors among red, blue, or yellow.

[0007] By the above-mentioned configuration, a color picture is decomposed into three colors of red, green, and blue, the 1st red correction value, the 2nd red correction value, and the threshold that receives green are used by claim 1, to each pixel which constitutes said color picture in case it changes into 2 color images which make said color picture red and make black an assignment color based on each of these light values, and it is  $G > KG$ . -- (1)

$$R > G + KR1 \text{ -- (2)}$$

$$R > G + KR2 \text{ -- (3)}$$

However, the red quantity of light  $G$  of the pixel for  $R$ :judging: The amount  $KG$  of green light of the pixel for a judgment : The threshold  $KR1$ :1st red correction value  $KR2$  which receives green : It has the function to calculate the 2nd red correction value. In the image processing system equipped with the color detecting element which judges the color of a pixel to the pixel in which the aforementioned (1) formula and (2) types are materialized, or the aforementioned (1) formula is abortive, and the aforementioned (3) formula is materialized to be red, and judges that the color of a pixel is not red to pixels other than this  $R \geq Tr$  -- (7)

$$G \geq Tg \text{ -- (8)}$$

$$B \leq Tb \text{ -- (9)}$$

However, the threshold  $Tg$  of the amount  $Tr$ :red of blue glow of the pixel for an amount [ of green light ]  $B$ :judging of the pixel for a red quantity-of-light  $G$ :judging of the pixel for  $R$ :judging:  $R < G + Tgr$  among the pixels which fulfill each decision conditions which are shown by threshold these (7) green and blue threshold  $Tb$ :- [ formula ] (9) formulas, and which are carried out -- (10)

Yellow etc. is identified at the same time it performs 2 color separation to red to the same pixel of a color copy image regardless of red discernment only by always setting up the threshold about colors other than an assignment color, for example, yellow etc., when an assignment color is red by judging the pixel which fulfills the conditions shown in this (10) type to be yellow.

[0008] In claim 2, a color picture is decomposed into three colors of red, green, and blue, the 1st blue correction value, the 2nd blue correction value, and the threshold that receives green are used to each pixel which constitutes said color picture in case it changes into 2 color images which make said color picture blue and make black an assignment color based on each of these light values, and it is  $R > KR$ . --

(4)

$B > R + KB1$  -- (5)

$B > R + KB2$  -- (6)

However, the red quantity of light B of the pixel for R:judging: The amount KR of blue glow of the pixel for a judgment : The threshold KB1:1st blue correction value KB2 over red : It has the function to calculate the 2nd blue correction value. In the image processing system equipped with the color detecting element which judges the color of a pixel to the pixel in which the aforementioned (4) formula and (5) types are materialized, or the aforementioned (4) formula is abortive, and the aforementioned (6) formula is materialized to be blue, and judges that the color of a pixel is not blue to pixels other than this

$R \geq Tr$  -- (7)

$G \geq Tg$  -- (8)

$B \leq Tb$  -- (9)

However, the threshold Tg of the amount Tr:red of blue glow of the pixel for an amount [ of green light ] B:judging of the pixel for a red quantity-of-light G:judging of the pixel for R:judging:  $R < G + Tgr$  among the pixels which fulfill each decision conditions shown by threshold these (7) green and blue threshold Tb:- [ formula ] (9) formulas -- (10)

Yellow etc. is identified at the same time it performs 2 color separation which receives blue to the same pixel of a color copy image only by always setting up the threshold about colors other than an assignment color, for example, yellow etc., regardless of blue discernment by judging the pixel which fulfills the conditions shown in this (10) type to be yellow, when an assignment color is blue.

[0009] By the setting range of the threshold which judges the setting range of the threshold which judges the color of a pixel to be red, or the color of said pixel in an image processing system according to claim 1 in claim 3 to be yellow when an assignment color is red By giving priority to the red used as an assignment color, and determining the color of a pixel, when the same pixels are judged to be red and yellow By the setting range of the threshold used when identifying the setting range or yellow of a threshold used when an assignment color is red, and identifying red, while the same pixel is identified by red When identified by yellow, priority is given to the direction discriminated from the red used as an assignment color, and the red image on a manuscript image is made to reproduce certainly by this.

[0010] By the setting range of the threshold which judges the setting range of the threshold which judges the color of a pixel to be blue, or the color of said pixel in an image processing system according to claim 2 in claim 4 to be yellow when an assignment color is blue By giving priority to the blue used as an assignment color, and determining the color of a pixel, when the same pixels are judged to be blue and yellow While the same pixel is identified by the setting range of the threshold used when identifying the setting range or yellow of a threshold used when an assignment color is blue, and identifying blue blue When identified by yellow, priority is given to the direction used as an assignment color identified as it is blue, and the blue image on a manuscript image is made to reproduce certainly by this.

[0011] When a monochrome manuscript image is specified as a manuscript image used as a processing object in an image processing system according to claim 1 or 2 in claim 5, When the manuscript image which serves as a processing object by identifying one color independently among red, blue, or yellow is specified as monochrome image, only the color specified among red, blue, or yellow is identified, and the color mark filled in by this on the manuscript is detected.

[0012] When a monochrome manuscript image is specified as a manuscript image used as a processing object in an image processing system according to claim 1 or 2 in claim 6, When the manuscript image which serves as a processing object by identifying two colors among red, blue, or yellow is specified as monochrome image, two colors specified among red, blue, or yellow are identified, and two kinds of color marks filled in by this on the manuscript are detected.

[0013]

[Embodiment of the Invention] Hereafter, this invention is explained to a detail based on the example of a gestalt shown in the drawing.

Principle explanation>> of the color separation approach used by <<this invention The detection approach of the color used as the principle of the color separation approach used by this invention, the

monochrome judgment approach, and the amendment approach of a color gap are explained referring to the block diagram shown in drawing 2 first in advance of detailed explanation of the image processing system by this invention.

<the detection approach of a color> -- first by the color detecting element 101 shown in drawing 2 As an assignment color, red or when [ blue ] it is, and it rubs, \*\* is set up and a color copy image is inputted into red, R signal acquired by dissociating green and blue, G signal, and B signal based on these contents of a setting, These R signal, G signal, and B signal are processed, a red pixel (or blue) and a black pixel are detected, and this detection result is supplied to the color gap amendment section 103 and monochrome judging section 102. It is confirmed whether fill three criteria which each pixel for a judgment shows in a degree type based on two correction value (the 1st red correction value and the 2nd red correction value) over the red set up beforehand and the threshold which receives green with the condition, i.e., the condition that red / black mode was specified, that red was specified in this case, in order to determine the detection range of red.

$G > KG$  -- (1)

$R > G + KR1$  -- (2)

$R > G + KR2$  -- (3)

however, the amount KG of green light of the pixel for a judgment shown with the value of the red quantity of light G:G signal of the pixel for a judgment shown with the value of a R:R signal : the threshold KR1:1st red correction value KR2:2nd red correction value which receives green -- and It is judged to which combination in the combination shown in degree table each of these check results belong. While the data which it is judged whether the pixel used as the candidate for a judgment is red, and it shows a color based on this judgment result are generated as shown in drawing 3 , and this is supplied to the color gap amendment section 103, the shown data which are not a color are generated and this is supplied to monochrome judging section 102.

[0014]

[Table 1]

式 (1)	式 (2)	式 (3)	判断の結果	備 考
1	1	無関係	赤	1 : 成立 0 : 成立せず
	0		赤でない	
0	無関係	1	赤	
		0	赤でない	

moreover, as an assignment color in the condition, i.e., the condition that blue / black mode was specified, that blue was specified In order to determine the blue detection range, it is confirmed whether fulfill three criteria which each pixel for a judgment shows in a degree type based on two correction value (the [ 1 blue correction value and ] 2 blue correction value) which is set up beforehand, and which receives blue, and the threshold to red.

$R > KR$  -- (4)

$B > R + KB1$  -- (5)

$B > R + KB2$  -- (6)

however, the amount KR of blue glow of the pixel for a judgment shown with the value of the red quantity of light B:B signal of the pixel for a judgment shown with the value of a R:R signal : threshold KB1: to red -- the -- 1 blue correction value KB2: -- the -- 2 blue correction value -- and It is judged to which combination in the combination shown in degree table each of these check results belong. While the data which it is judged whether the pixel used as the candidate for a judgment is blue, and it shows a color based on this judgment result are generated as shown in drawing 4 , and this is supplied to the color gap amendment section 103, the shown data which are not a color are generated and this is supplied to monochrome judging section 102.

[0015]

[Table 2]

式 (4)	式 (5)	式 (6)	判断の結果	備 考
1	1	無関係	青	1: 成立 0: 成立せず
	0		青でない	
0	無関係	1	青	
		0	青でない	

Moreover, it checks and it is  $R \geq Tr$  whether three criteria which are set up beforehand and which each pixel for a judgment shows in a degree type based on a red threshold, a green threshold, a blue threshold, and green correction value are filled with the color detecting element 101 with judgment processing of the assignment color mentioned above. -- (7)

$G \geq Tg$  -- (8)

$B \leq Tb$  -- (9)

however threshold  $Tg$ : of the amount  $Tr$ :red of blue glow of the pixel for a judgment shown with the value of the amount  $B$ :B signal of green light of the pixel for a judgment shown with the value of the red quantity of light  $G$ :G signal of the pixel for a judgment shown with the value of a  $R$ :R signal -- green threshold  $Tb$ : -- a blue threshold -- about the pixel which fulfills each decision conditions of these The pixel which fulfills the conditions shown in a degree type is judged to be yellow, and this judgment result is supplied to the color gap amendment circuit 103.

$R < G + Tgr$  -- (10)

When red / black mode is set up, R signal acquired by decomposing by this, G signal, and B signal a color copy image on 3 color spaces of RGB When it separates into red, blue, and yellow as shown in drawing 5, and blue / black mode is set up, R signal acquired by disassembling a color copy image, G signal, and B signal are divided into blue, red, and yellow on 3 color spaces of RGB, as shown in drawing 6.

[0016] In the <monochrome judgment approach> and monochrome judging section 102 As opposed to the pixel judged except red in red / black mode based on the data which are not the color outputted from the color detecting element 101, or the pixel judged except blue in blue / black mode Based on degree table, it is confirmed whether the brightness of each pixel fulfills monochrome criteria, monochrome data are generated based on this check result, and this is supplied to the color gap amendment section 103.

[0017]

[Table 3]

判 断 式	結 果	備 考
$(2R + 5G + B) / 8 > K_{th}$	白	$K_{th}$ : 輝度に対する白黒判定のしきい値
$(2R + 5G + B) / 8 \leq K_{th}$	黒	

In the <amendment approach of a color gap>, and the color gap amendment section 103 The data which are the color supplied from the color detecting element 101, and monochrome data supplied from monochrome judging section 102 are incorporated. Each pixel which is around an object pixel about the pixel which discernment processing of a color finished is checked. If it was confirmed whether the color gap which originates in the Rhine location gap of the lighting nonuniformity of a reading system and CCD etc. in the edge part of each image etc. had arisen and these have arisen, this will be amended and brightness image data and color image data will be generated. As the amendment approach, an attention pixel, for example The right and left on the Rhine same as a main pixel, As 25 pixels which are in the same location of two lines before and behind [ respectively ] each pixel which exists up and down, and a main scanning direction show to drawing 7, the matrix of 5x5 is built, and it centers on an attention pixel on this matrix. Drawing 8 (a) As shown in - (h), after eight linear patterns which consist of four pixels which make an attention pixel the 3rd pixel in a lengthwise direction, a longitudinal direction, and the direction of slant were extracted, The color of the attention pixel contained in the 3rd of each [ these ] linear pattern based on degree table is amended from a color to black or from black to a color. [0018]



[Table 4]

No	補正前のパターン	補正処理	補正後のパターン
1	色、色、 <u>黒</u> 、白	黒→色	色、色、 <u>色</u> 、白
2	黒、黒、 <u>色</u> 、白	色→黒	黒、黒、 <u>黒</u> 、白
3	白、黒、 <u>色</u> 、白	色→黒	白、黒、 <u>黒</u> 、白
4	黒、色、 <u>色</u> 、白	色→黒	黒、色、 <u>黒</u> 、白
5	白、色、 <u>色</u> 、黒	色→黒	白、色、 <u>黒</u> 、黒
6	黒、黒、 <u>色</u> 、黒	色→黒	黒、黒、 <u>黒</u> 、黒
7	白、黒、 <u>色</u> 、黒	色→黒	白、黒、 <u>黒</u> 、黒

□の文字：注目画素

基準パターンは、No1からNo6までとNo1からNo7までの2組がある。

Explanation>> of the example of <<gestalt Next, the image processing system by this invention which performs detection of a color, monochrome judgment, and amendment of a color gap is explained to a detail by such amendment approach, referring to a drawing. Drawing 1 is the block diagram showing the example of 1 gestalt of the image processing system by this invention. The image processing system 1 shown in this drawing The register section 2 and the input selection section 3, The color detecting element 4, the brightness count section 5, the color judging section 6, and the matrix generation section 7, When it has the pattern-matching section 8, the color gap amendment section 9, the yellow detecting element 10, the timing controller 11, and the output mode processing section 12 and red / black mode is specified The image processing of R signal acquired by disassembling a color copy image based on an aforementioned (1) formula - (3) type, Tables 1-4, and an aforementioned (7) formula - (10) type, G signal, and the B signal is carried out. When development counter color data, brightness data, and yellow data are generated and blue / black mode is specified Based on the (4) type - (6) type mentioned above, Tables 1-4, and an aforementioned (7) formula - (10) type, the image processing of R signal acquired by disassembling a color copy image, G signal, and the B signal is carried out, and development counter color data, brightness data, and yellow data are generated.

[0019] In this case, the 1st mode signal with which the register section 2 shows the mode of color separation, A yellow detection threshold required for detection of the 2nd mode signal, a brightness threshold required for a monochrome judgment, and a color, and the judgment of a color, When it is the part which saves property data, such as the 1st color correction value, the 2nd color correction value, and a color threshold, and red / black mode is specified by the 1st and 2nd mode signal While incorporating the yellow detection threshold inputted from the outside, a brightness threshold, the 1st red correction value over red, the 2nd red correction value, and the threshold that receives green and memorizing this, each of these property data are respectively supplied to the color judging section 6, the color detecting element 4, and the input selection section 3. Moreover, when blue / black mode is specified, while incorporating the yellow detection threshold inputted from the outside, a brightness threshold, the 1st blue correction value which receives blue, the 2nd blue correction value, and the threshold which receives green and memorizing this, each of these property data are respectively supplied to the color judging section 6, the color detecting element 4, and the input selection section 5.

[0020] While the input selection section 3 incorporates R signal acquired by separating a color copy image, G signal, and B signal In the mode specified with the 1st mode signal outputted from the register section 2 When it is the part which chooses two signals from these R signal, G signal, and B signal and red / black mode is specified by said 1st mode signal, When R signal and G signal are chosen among said R signal, G signal, and B signal, and this is supplied to the color detecting element 4 and blue / black mode is specified by said 1st mode signal, R signal and B signal are chosen among said R signal, G signal, and B signal, and this is supplied to the color detecting element 4. The 1st color correction value of the assignment color outputted from the register section 2, the 2nd color correction value, and a threshold are used for the color detecting element 4. two signals (two, R signal and G signal, or R signal --) outputted from said input selection section 3 The image processing explained by the color detection approach mentioned above for every pixel is performed to two of B signals, and the color information on each pixel which is a part and was obtained in this detection actuation that that of each pixel detects

whether it is an assignment color is supplied to the color judging section 6.

[0021] Moreover, the brightness count section 5 calculates the brightness of each pixel shown by these R signal, G signal, and B signal, and supplies this count result (brightness information of each pixel) to the color judging section 6 and the timing controller 11 while it incorporates 8-bit R signal acquired by separating a color copy image, G signal, and B signal. The color judging section 6 uses the brightness threshold outputted from the register section 2. As opposed to the color information outputted from the color detecting element 4, and the brightness information of each pixel outputted from the brightness count section 5 The image processing explained by the color detection approach mentioned above and the monochrome judging approach is performed for every pixel, and the color of each pixel is the part judged from an assignment color, black, and white, and supplies this judgment result (color information on each pixel) to the matrix generation section 7. The matrix generation section 7, incorporating the color information on each pixel outputted from the color judging section 6, and holding this per five lines An attention pixel is made into a main pixel. Before or after the right and left on the same Rhine, each pixel which exists up and down, and a main scanning direction, The matrix of 5x5 is built by 25 pixels which are in the same location of two lines, respectively. It is the part which extracts eight linear patterns which consist of four pixels which make an attention pixel the 3rd pixel in a lengthwise direction, a longitudinal direction, and the direction of slant a core [ an attention pixel ] on this matrix, and eight linear patterns obtained by this extract processing are supplied to the pattern-matching section 8.

[0022] The pattern-matching section 8 is a part which compares with each linear pattern the reference pattern set up beforehand, and supplies each of these comparison results to the color gap amendment section 9 while it incorporates eight linear patterns outputted from said matrix generation section 7. It is the part which judges whether the color gap amendment section 9 amends the color of the attention pixel contained in the 3rd of each of these linear patterns about the linear pattern in which each comparison result outputted from said pattern-matching section 8 is incorporated, and coincidence is shown. The color of the attention pixel which performs color correction of an attention pixel according to the contents of Table 4 mentioned above, and is contained in the 3rd of each linear pattern black from a color or after amending in a color from black, supply pixel information [ finishing / color correction ] to the output mode processing section 12, and about a conflicting linear pattern The information on this pixel is supplied to the output mode processing section 12 as it is, without carrying out color correction of the pixel contained in the 3rd of each of these linear patterns.

[0023] Moreover, a yellow detecting element 10 supplies the color information on each pixel which is a part and was obtained in this detection actuation that use the yellow detection threshold outputted from the register section 2, perform the image processing explained by the yellow detection approach which mentioned the color copy image above for every pixel to 8-bit R signal acquired by dissociating, G signal, and B signal, and each pixel detects whether it is yellow to the timing controller 11. The color information on each pixel that the timing controller 11 is outputted from the color gap amendment section 9, The output timing of the brightness information of each pixel outputted from the brightness count section 5 and the color information on each pixel outputted from said yellow detecting element 10 is adjusted. The brightness information of each pixel which the same color information about a pixel and brightness information are the parts supplied to the output mode processing section 12 to the same timing, and is outputted from the brightness count section 5, After delaying only the time delay which incorporates the color information on each pixel outputted from said yellow detecting element 10, and is set up beforehand, these brightness information and color information are supplied to the output mode processing section 12. While the output mode processing section 12 incorporates the color information on each pixel outputted from the color gap amendment section 9, the brightness information of each pixel outputted from said timing controller 11, and the color information on each pixel It is based on the mode assignment signal outputted from the register section 2. The color information on each [ these ] pixel, While processing the color information on said each pixel, and brightness information based on brightness information by the priority according to the mode specified by the mode assignment signal which is the part which determines the color of each pixel, and brightness, and is outputted from the

register section 2 and determining the color of each pixel Based on this decision result, one or two are generated for development counter color data, brightness data, and yellow data, and this is supplied to a development unit device (illustration is omitted) etc.

[0024] thus, in this example of a gestalt, when red / black mode is specified Based on an aforementioned (1) formula - (3) type, Tables 1-4, and an aforementioned (7) formula - (10) type, the image processing of R signal acquired by disassembling a color copy image, G signal, and the B signal is carried out.

When development counter color data, brightness data, and yellow data are generated and blue / black mode is specified Based on the (4) type - (6) type mentioned above, Tables 1-4, and an aforementioned (7) formula - (10) type, the image processing of R signal acquired by disassembling a color copy image, G signal, and the B signal is carried out. Since development counter color data, brightness data, and yellow data were generated Only by always setting up the threshold about colors other than an assignment color, for example, yellow etc., regardless of red discernment, when an assignment color is red Yellow etc. is discriminable while performing 2 color separation to red to the same pixel of a color copy image. Moreover, only by always setting up the threshold about colors other than an assignment color, for example, yellow etc., regardless of blue discernment, when an assignment color is blue, while performing 2 color separation which receives blue to the same pixel of a color copy image, yellow etc. is discriminable.

[0025] Moreover, in this example of a gestalt, process the color information on each pixel, and brightness information by the output mode processing section 12, and since he is trying to choose the color of a pixel by the priority according to the specified mode By the setting range of the threshold used when identifying the setting range or yellow of a threshold used when an assignment color is red and red is identified, while the same pixel is identified by red Priority can be given to the direction discriminated from the red which is an assignment color when identified by yellow. Moreover, while the same pixel is identified blue by the setting range of the threshold used when identifying the setting range or yellow of a threshold used when an assignment color is blue and blue is identified Priority can be given to the direction used as an assignment color identified as it is blue when identified by yellow. Moreover, while the output of the color detecting element 4 and the output of the brightness count section 5 are processed and the color of each pixel makes an assignment color, black, and white judge by the color judging section 6 in this example of a gestalt By the yellow detecting element 10, each pixel makes it detect whether it is yellow, and since each of these judgment results and each detection result are made to judge synthetically by the output mode processing section 12 and he is trying to determine the color of each pixel When the manuscript image used as a processing object is specified as monochrome image, two colors as which only red, blue, or the color specified among yellow was specified can be made to identify.

[0026]

[Effect of the Invention] As explained above, when an assignment color is red, while performing 2 color separation to red to the same pixel of a color copy image, according to this invention, by claim 1, yellow etc. can be identified regardless of red discernment only by always setting up the threshold about colors other than an assignment color, for example, yellow etc. Moreover, in claim 2, when an assignment color is blue, while performing 2 color separation which receives blue to the same pixel of a color copy image, yellow etc. can be identified regardless of blue discernment, only by always setting up the threshold about colors other than an assignment color, for example, yellow etc.

[0027] Moreover, by the setting range of the threshold used when identifying the setting range or yellow of a threshold used in claim 3 when an assignment color is red, and identifying red, while the same pixel is identified by red When identified by yellow, priority can be given to the direction discriminated from the red used as an assignment color, and the red image on a manuscript image can be made to reproduce certainly by this. Moreover, while the same pixel is identified by the setting range of the threshold used when identifying the setting range or yellow of a threshold used in claim 4 when an assignment color is blue, and identifying blue blue When identified by yellow, priority can be given to the direction used as an assignment color identified as it is blue, and the blue image on a manuscript image can be made to reproduce certainly by this.

[0028] Moreover, in claim 5, when the manuscript image used as a processing object is specified as monochrome image, only the color specified among red, blue, or yellow can be identified, and the color mark filled in by this on the manuscript can be detected. Moreover, in claim 6, when the manuscript image used as a processing object is specified as monochrome image, two colors specified among red, blue, or yellow can be identified, and two kinds of color marks filled in by this on the manuscript can be detected.

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[Translation done.]